

# **TWO-DIMENSIONAL DUAL-FREQUENCY ANTENNA AND ASSOCIATED DOWN-CONVERSION METHOD**

## **ABSTRACT OF THE DISCLOSURE**

A two-dimensional dual-frequency antenna array includes a plurality of dual-frequency antenna array elements configured to receive signals having first and second frequencies. The array elements of the two-dimensional antenna array may be structured to have half-wave dipole resonances – both at the mid-frequency of the two beams, merged to form the interference field, and also at the difference frequency, down converted from the first and second frequencies. Each individual dual-frequency antenna of the two-dimensional antenna array includes a plurality of dipole antennas, array elements, a plurality of nonlinear resonant circuits. The nonlinear resonant circuits interconnect the dipole antennas and are configured to permit re-radiation of signals having the third (difference) frequency in the form of resonant dipole radiation (resonant at the difference frequency).

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